



**MANITOBA – MINNESOTA TRANSMISSION PROJECT**  
**Environmental Impact Statement**

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# **CONCLUSIONS**

**CHAPTER 24**  
SEPTEMBER 2015

# TABLE OF CONTENTS

<b>24</b>	<b>CONCLUSIONS.....</b>	<b>24-1</b>
24.1	Project Setting .....	24-2
24.2	Summary of Key Conclusions from the Assessment .....	24-2
24.3	Summary of Mitigation Measures and Commitments .....	24-9
24.4	Summary of Residual Effects .....	24-10
24.5	Summary of Cumulative Environmental Effects .....	24-10
24.6	Concluding Statement and Summary .....	24-11
24.7	References .....	24-12

# LIST OF TABLES

	<b>Page</b>
Table 24-1    Summary of the EIS for MMTP .....	24-3

# ABBREVIATIONS AND ACRONYMS

CEAA 2012	<i>Canadian Environmental Assessment Act, 2012</i>
CEnvPP	Construction Environmental Protection Plan
EIS	environmental impact statement
ESS	environmentally sensitive site
FNMEP	First Nations and Metis Engagement Process
FPR	final preferred route
MH	Manitoba Hydro
MMTP	Manitoba-Minnesota Transmission Project (the Project)
NEB	National Energy Board
PEP	Public Engagement Process
RAA	regional assessment area
ROW	right-of-way
VC	valued component

## 24 Conclusions

This Environmental Impact Statement (EIS) is being submitted as a component of the regulatory approvals process under *The Environment Act* (Manitoba), as well as incorporating relevant filing requirements under the *National Energy Board Act (NEB Act)* and the *Canadian Environmental Assessment Act, 2012 (CEAA 2012)*. It is based on more than five years of planning, routing and design work, involving a multidisciplinary team of technical specialists, Aboriginal Traditional Knowledge studies, focused field and desktop studies and several rounds of opportunities for engagement with First Nations and Metis, local landowners, local municipalities, stakeholder groups and government departments. The transmission line routing and design process considered understandings gained from gathering this knowledge, and resulted in a Final Preferred Route (FPR) that avoids or reduces many potential effects of the Project. Where potential effects could not be avoided by routing, additional mitigation measures were developed, such as scheduling construction activities to be considerate of sensitive time periods for fish and wildlife. In addition, several monitoring and management plans will be developed to verify predictions and prescribe environmental protection measures to be followed. With the careful routing and proposed mitigation and monitoring commitments Manitoba Hydro anticipates no significant adverse environmental effects associated with the Project.

More than 40% of the 213 km transmission line has been routed within existing transmission corridors. This reduced the amount of land required for new Right of Way (ROW) and in turn reduced potential effects. The process used to determine the location of the rest of the FPR utilized a transmission line routing process (Chapter 5) that has been adapted over numerous years of Manitoba Hydro experience and has incorporated feedback from Public Engagement Process (PEP) (Chapter 3) and First Nations and Metis Engagement Process (FNMEP) (Chapter 4) and environmental analysis at numerous stages of route selection. Rather than minimize effects on any one facet of the environment, this process sought to balance the effect of the transmission line across relevant perspectives (natural environment, built environment, technical considerations) and in the process produced a route that minimized the overall effect of the transmission line.

Manitoba Hydro's study team has produced a detailed EIS to meet the requirements of the provincial and federal environmental regulatory approvals processes. Integral to the assessment was comprehensive engagement through the PEP and FNMEP. Desktop and field studies, Aboriginal Traditional Knowledge, and learnings from past environmental assessments were used to identify potential residual effects following the application of mitigation measures identified and incorporated in Project planning. Further, Manitoba Hydro has developed an Environmental Protection Program incorporating monitoring and adaptive management.

The EIS describes a Project that balances the concerns and sensitivities of the environment and potentially affected people and that facilitates the conveyance of clean, renewable energy to southern markets, builds reliability within the Manitoba transmission system and contributes to

Manitoba's economic future. The Valued Components (VCs) that served to focus the assessment within the EIS captured key elements of the biophysical and socioeconomic environment, and are listed in the summary table (Table 24-1).

## 24.1 Project Setting

The Project is located in a region of southern Manitoba in which the original native ecology has been substantially affected through more than one hundred years by human development. This change has been dominated by conversion of native prairie to agricultural lands, accompanied by urban and rural settlements, public infrastructure, and various other land uses. As a result, there has been a gradual displacement of natural features. For example, when the regional assessment area (RAA) for the Vegetation and Wetlands VC and the Wildlife and Wildlife Habitat VC is considered, it was calculated that 48% of the RAA land base has been modified by agricultural conversion and, to a lesser extent, by industrial and residential development. Effects have been greatest in the Existing Corridor portion of the RAA, which is closest to the City of Winnipeg. Human disturbances are present in the New ROW RAA, but much of the area is still composed of native vegetation and wetlands and contains sensitive wildlife habitats and key wetlands. Chapter 6 describes the environmental and socio-economic setting in detail.

## 24.2 Summary of Key Conclusions from the Assessment

The environmental assessment began with the identification of potential Project effects, focused fieldwork, technical studies of the Project area, and a robust engagement program aimed at understanding key issues and areas of importance which helped determine the VCs that served as the focus of the EIS. VCs are aspects of the biophysical and socio-economic environment that could be affected by the Project and are of particular value to regulators or other interested parties. The VCs selected for the assessment are Fish and Fish Habitat, Vegetation and Wetlands, Wildlife and Wildlife Habitat, Traditional Land and Resource Use, Heritage Resources, Infrastructure and Services, Employment and Economy, Agriculture, Land and Resource Use, Visual Quality, Community Health and Well-being, and Human Health Risk. Residual effects of the Project on these VCs were identified after the consideration of standard and Project-specific mitigation. Determinations of significance of these effects and cumulative effects were made for each of the VCs. A summary of the VC assessment is presented in Table 24-1.

Table 24-1: Summary of the EIS for MMTP

Valued Component/ Environmental Effect	Key Mitigation Measures	Project Residual Effects								Project Effects Summary	Cumulative Residual Effects						Cumulative Effects Summary	
		Pre-Construction (P) Operation (O)	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context		Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility		Ecological and Socio-economic Context
<b>Fish and Fish Habitat</b>																		
Fish Habitat	<ul style="list-style-type: none"> <li>Within 30 m of watercourse crossings, removal of riparian vegetation in the ROW will be limited to select plants required to accommodate overhead lines, and uprooting of plants will be limited.</li> <li>Construction activities surrounding watercourses will take place within Reduced Risk Timing Windows.</li> <li>Erosion protection and sediment control measures will be put in place at all Project locations where surface drainage is likely to flow into fish-bearing water</li> </ul>	C	N	L	LAA	ST	IR	R	D	Effects on fish and fish habitat are expected to be negligible. Mitigation measures for effects of the Project on fish and fish habitat are expected to result in no residual effects. Any changes will not be discernable from natural variations. The effects of the Project on fish and fish habitat is assessed as not significant.	Due to negligible residual Project effects, a cumulative effects assessment was not conducted.							
		O	N	L	LAA	P	IR	R	D									
Fish Mortality or Health		C	N	L	LAA	ST	IR	R	D									
		O	N	L	LAA	P	IR	R	D									
<b>Wildlife and Wildlife Habitat</b>																		
Habitat Availability	<ul style="list-style-type: none"> <li>Sensitive wildlife habitat and movement areas were considered during routing, including Wildlife Management Areas, Protected Areas, proposed Ecological Reserves and large tracts of intact forests and wetlands</li> <li>Construction schedules were planned to reduce potential effects, including being sensitive to ungulate calving periods and by conducting most clearing work in the winter, when many wildlife species have migrated and frozen ground conditions reduce effects on soil, vegetation and waterways</li> <li>To reduce the potential for collisions with wires following wire installation, bird diverters will be placed at environmentally sensitive sites</li> <li>Existing access will be used as much as possible</li> </ul>	C	A	L	LAA	ST/P	S/IR	R	D	Changes to habitat intactness and sensitive wildlife habitat is expected to be minimal along portions of the Project that follow existing corridors (SLTC / RVTC). The Project has avoided the core range of the Vita elk herd and only has a small contribution to existing levels of habitat fragmentation, along with minimal loss of natural wildlife habitat availability. Mitigation measures are expected to reduce collision risk to birds and minimize hunter and predator access. The effects of the Project on wildlife and wildlife habitat is assessed as not significant.	A	L	RAA	P	C	R	D	The Project, in combination with other future projects, will have small contributions to cumulative effects on wildlife and wildlife habitat. The transmission line routing process considered the potential change in habitat availability, and many of the future projects are located in previously disturbed, modified wildlife habitats.
Mortality Risk		C	A	L	LAA	ST	IR	R	D									
		O	A	L	LAA	ST/P	S/IR	R	D									
		O	A	L	LAA	ST/P	S/IR	R	D									
<b>Vegetation and Wetlands</b>																		
Vegetation Landscape Intactness	<ul style="list-style-type: none"> <li>Use of existing corridors for routing of a large portion of the line</li> <li>Through routing, 180 of 202 large native vegetation patches within the RAA will be left intact.</li> <li>Preconstruction surveys will be conducted to protect rare plants that have not been identified to date, with the exception of ash trees</li> <li>Buffers and setbacks will be applied during clearing activities to protect species at risk and high quality riparian habitats</li> </ul>	C/O	A	M	RAA	P	S	R	D/U	Changes to vegetation intactness, wetland function and native cover are expected to be minimal along portions of the Project following existing ROWs (SLTC / RVTC). Along the new ROW, the Project will intersect some large intact patches of vegetation and large wetlands. However, the function of these wetlands is not measurably reduced due to their large size, and because routing largely skirts the edges and is located mainly in the surrounding upland vegetation. Clearing of the right-of-way will result in the loss of tree and shrub habitat which will change vegetation structure in the cleared areas. This will result in a change in native vegetative cover class, but this change is anticipated to be reversible as the right-of-way regenerates over time. The effects of the Project on vegetation and wetlands is assessed as not significant.	A	M-H	RAA	P	C	I	D/U	The Project and other known and reasonably foreseeable future projects will contribute to cumulative effects on landscape intactness, native upland vegetation cover classes, wetland cover classes, invasive plant species, rare plant species, and traditional use plant species that have already been reduced in abundance in the RAA. The on-going effects of new projects will be minor relative to existing pressures, and are not expected to threaten the viability of vegetation and wetland features. The Project's contribution to cumulative effects are less than 1% change in vegetation and wetland cover classes and in some cases changes are not measureable.
Vegetation Cover Class Abundance, Distribution and Structure		C	A	L	LAA	P	S	R	D/U									
Wetland Class Abundance, Distribution, Structure and Function		O	A	L	LAA	P	IR	R	D/U									
Invasive Plant Species Abundance and Distribution		C	A	L	LAA	P	S	I	D/U									
Rare Plant Species Abundance and Distribution		O	A	L	LAA	P	IR	I	D/U									
		C	A	M	LAA	P	S	I	D/U									
		O	A	L	LAA	P	IR	I	D/U									
Traditional Use Plant Species Abundance and Distribution		C	A	L	PDA	P	S	R	D/U									
	O	A	L	PDA	P	IR	R	D/U										
<b>Traditional Land and Resource Use</b>																		
Plant Harvesting	<ul style="list-style-type: none"> <li>Transmission line routing avoided areas of traditional land and resource use, as identified by First Nations, wherever possible.</li> <li>Development and implementation of a Cultural and Heritage Resources Protection Plan.</li> </ul>	C/O	A	M	PDA	P	C	I	D	The transmission line routing process considered cultural and heritage sites, and that the disturbance of cultural sites or alteration to the experience of traditional cultural practices may impair the ability to use that site. The Project is not expected to affect the ability to use or access trails and travelways outside the right-of-way. Although the Project is unlikely to have a measurable effect on wildlife abundance in the LAA, the effect on trapping may be measureable if a trapping site is located within the PDA. The Project is not expected to restrict access to cultural sites outside of the PDA and routing has avoided known sites within the PDA. The effect of the Project on traditional land and resource use is assessed as not significant.	A	M	RAA	P	C	I	D	Plant harvesting, hunting and trapping, travelways and cultural sites would not be directly affected by the Project; however, they may be affected by future and planned activities. The Project's contributions to cumulative effects on TLRU are anticipated to be incremental and minor.
Hunting and Trapping		C/O	A	M	LAA	P	R	I	D									
Travel		C/O	A	L	PDA	P	C	I	D								The cumulative effects of the Project and future projects on traditional land and resource use are assessed as not significant.	
Cultural Sites		C/O	A	L	PDA	P	C	I	D									

KEY (See VC Chapters [Chapters 8-19] for detailed definitions)  
 Direction: A: Adverse; N: Neutral; P: Positive  
 Magnitude: N: Negligible; L: Low; M: Moderate; H: High Geographic Extent:  
 PDA: ROW/Site; LAA: Local; RAA: Regional  
 Duration: ST: Short-term; MT: Medium-term; P: Permanent

Frequency: S: Single event; IR: Irregular event; R: Regular event; C: Continuous  
 Reversibility: R: Reversible; I: Irreversible  
 Ecological Context: U: Undisturbed; D: Disturbed  
 Socio-economic Context: HR: High Resilience; MR: Moderate Resilience; LR: Low Resilience  
 N/A Not applicable

Valued Component	Key Mitigation Measures	Project Residual Effects							Project Effects Summary	Cumulative Residual Effects						Cumulative Effects Summary		
		Pre-Construction (P) Operation (O)	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility		Ecological and Socio-economic Context	Direction	Magnitude	Geographic Extent	Duration	Frequency		Reversibility	Ecological and Socio-economic Context
<b>Infrastructure and Services</b>																		
Accommodations	<ul style="list-style-type: none"> <li>Transmission line routing avoided interference with infrastructure wherever possible</li> <li>Continued engagement with local government and service providers to reduce adverse effects on infrastructure and services including the development of an Emergency Response Plan to maintain appropriate emergency response times, use of work camps if local accommodations cannot handle the work force, use of waste and recycling management plans, use of group transportation for workers,</li> </ul>	C	A	L	LAA	ST	C	R	LR-HR	The Project is located in relative close proximity to large service centres and a relatively small workforce size is anticipated so demands on accommodations, community infrastructure and services, fire and police services, as well as water, wastewater, and solid waste facilities are within available capacity to meet Project demands. Most roads currently operate at an acceptable level of service and therefore have available capacity to meet this increase in volume. The predicted levels of radio noise are not expected to interfere with communications and radio signals. The effect of the Project on infrastructure and services is assessed as not significant.	A	M	RAA	ST	C	R	LR-HR	Cumulative demands of the Project and other reasonable foreseeable future projects are not anticipated to exceed the available capacity or result in a substantial decrease in the quality of service on a persistent and ongoing basis. The contribution of the Project to overall cumulative effects on accommodations, community infrastructure and services, and road traffic is relatively small. The workforce and Project activity demands account for a modest portion of the overall cumulative demand for such infrastructure and services. The cumulative effects of the Project and future projects on infrastructure and services are assessed as not significant.
Community Infrastructure and Services		C	A	L	LAA	ST	C	R	MR-HR		A	L-M	RAA	ST	C	R	MR-HR	
Road Traffic		C	A	L	LAA	ST	IR	R	LR-HR		A	L-M	RAA	ST	IR	R	LR-HR	
Transportation and Utility Infrastructure		C	A	L-M	PDA	ST	IR	R	MR-HR		A	L-M	PDA	MT	C	R	MR-HR	
		O	A	N	PDA	N/A	N/A	N/A	N/A		A	L-M	/RAA	MT	C	R	MR-HR	
Communications and Radio Signals		O	A	N/LM	PDA-LAA	MT	C	R	HR		A	L-M	/RAA	MT	C	R	HR	
<b>Employment and Economy</b>																		
Local Employment	<ul style="list-style-type: none"> <li>Manitoba Hydro will work with the contractors through the contracting process to promote participation of First Nation, MMF, and Manitoba businesses in the Project.</li> </ul>	C	P	L	LAA	ST	C	N/A	N/A	Project purchasing will create employment, result in business opportunities via the purchase of goods and services, contribute to the provincial and federal GDP, and additionally generate local, provincial, and federal revenue. The procurement of services is considered a beneficial effect, and local service providers will not be adversely affected.	P	L	RAA	ST	C	N/A	N/A	Effects on employment and economy will be positive. Project effects on labor and economic activity will act cumulatively with the economic effects of concurrent projects. Projects in the RAA will provide economic benefits, increased business opportunities and revenue generation.
Goods and Services		O	P	L	LAA	MT	C	N/A	N/A		P	M	RAA	ST	C	N/A	N/A	
GDP		C	P	M	RAA	ST	C	N/A	N/A		P	M	RAA	ST	C	N/A	N/A	
		O	P	L	RAA	MT	C	N/A	N/A		P	M	RAA	ST	C	N/A	N/A	
Government Revenue		C	P	M	RAA	ST	C	N/A	N/A		P	M	RAA	ST	C	N/A	N/A	
		O	P	L	RAA	MT	C	N/A	N/A		P	M	RAA	ST	C	N/A	N/A	
<b>Agriculture</b>																		
Loss or Degradation of Agricultural Land	<ul style="list-style-type: none"> <li>Transmission line routing avoided where possible agricultural buildings and paralleled field boundaries</li> <li>Construction of self supporting lattice towers in agricultural areas to reduce the tower footprint and number of towers</li> <li>Manitoba Hydro Biosecurity Policy</li> <li>Land owner Compensation Policy</li> </ul>	C	A	L-M	PDA	ST-MT	S-IR	R	HR	The area of land that will be removed from agriculture will be a small proportion of the total land available for agriculture in both the LAA and RAA. The Project is not anticipated to result in a loss of agricultural land or degradation of soil quality such that existing agricultural production cannot continue at current levels for extended periods of time (beyond the construction phase) or cannot be adequately compensated. The effect of the Project on loss or degradation of agricultural land is assessed as not significant.	A	L	RAA	P	IR	R	HR	The cumulative effects on loss or degradation of agricultural land and conflicts with agricultural activities are not anticipated to occur at levels that widely disrupt or restrict agricultural operations such that existing agricultural production cannot continue within the RAA at current levels for extended periods. The Project's contribution to permanent loss of agricultural land will occur at the tower and station footprints and will cover less than 12 ha. The cumulative effects of the Project and future projects on agriculture are assessed as not significant.
		O	A	L	PDA	MT-P	S-IR	R	HR									
Conflict with Agricultural Activities		C	A	L-M	LAA	ST-MT	IR	R	MR-HR	Interference/disruption of agricultural activities are not anticipated to occur at levels that would restrict agricultural operations such that existing agricultural production cannot continue within the area traversed by the Project at current levels for extended periods (beyond construction). The effect of the Project on conflict with agricultural activities is assessed as not significant.	A	M	RAA	P	C	R	MR	
		O	A	L-M	LAA	MT-P	R-C	R	MR-HR									
<b>Land and Resource Use</b>																		
Property	<ul style="list-style-type: none"> <li>The use of existing transmission corridors for routing of a large portion of the line</li> <li>Notification of resource users</li> <li>Use of existing access roads and trails</li> <li>Maintaining a buffer of trees between a site/trail and the transmission line right-of-way in areas where site-specific issues of concern have been identified</li> <li>Implementation of the Manitoba Hydro Land Owner Compensation Policy</li> </ul>	C	A	L-M	PDA	ST	C	R	MR	Project effects on property values though mixed will be low, small or non-existent, and if present, are anticipated to decrease with distance from the transmission line and decrease or disappear over time, and will vary depending on the location and visibility of transmission towers to properties. The effect of the Project on property values is assessed as not significant.	A	L-M	RAA	MT	C	R	MR	The cumulative effects from disruption, disturbance of land and resource base and the reduction or loss of resources are not anticipated to occur at levels that restrict land and resource activities such that existing activities cannot continue within the RAA at current levels. The Project's contribution to cumulative effects on land and resource use will be restricted to the PDA, with little effect on the land base available for land and resource use in the RAA. The cumulative effects of the Project and future projects on land and resource use are assessed as not significant.
Designated Lands, Protected Areas and Recreation		C	A	L	PDA	ST	C	R	MR	The project will not affect any federally or provincially protected lands, and will likely have a low disturbance effect on recreational areas and activities. The effect of the Project on designated lands, protected areas and recreation is assessed as not significant.	A	L-M	RAA	MT	C	R	MR	
		O	A	L	PDA	MT	C	R	MR									
Forested Areas		C	A	L	PDA	P	S	R	MR	The loss of commercial forest area and reduction of Annual Allowable Cut levels will only have a small effect on productive forestland. The reduction in area related to the change in value and quality of affected woodlots represents a small area. The removal of shelterbelts is also small but may be of higher importance to the individual landowner. The loss of private and municipal productive forestland is small and the overall land use functionality of the remaining forested areas will be unchanged. The effect of the Project on land use of forested areas is assessed as not significant.	A	L	RAA	P	S	R	MR	
Groundwater Use		C/O	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No residual effect is anticipated for groundwater resources as a result of project activities.	Due to negligible residual Project effects, a cumulative effects assessment was not conducted.							
Mining / aggregates		C	A	L	PDA	ST	C	R	MR	The potential effects of the project are not expected to degrade the quality of mining/aggregate extraction activities as the Project overlap with mining activities and dispositions is minimal. The effect of the Project on mining and aggregates is assessed as not significant.	A	L	RAA	MT	C	R	MR	
		O	A	L	PDA	MT	R/C	R	MR									

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Ecological Context: U: Undisturbed; D: Disturbed

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<b>Land and Resource Use (cont'd)</b>																		
Hunting and Trapping		C	A	L	PDA	ST	C	R	MR	Physical project disturbance effects on hunting (i.e., GHAs) and open trapping (i.e., OTAs) will be minimal. The effect of the Project on hunting and trapping is assessed as not significant.								
		O	A	L	PDA	MT	R/C	R	MR									
<b>Heritage Resources</b>																		
Heritage Resource Sites	<ul style="list-style-type: none"> <li>Transmission line routing avoided heritage resource sites where possible</li> <li>Education of contractors</li> <li>Preconstruction monitoring</li> </ul>	C/O	N-A	L-M	LAA	P	S	I	D	There are no anticipated changes to the number or integrity of known heritage resources or cemeteries. The potential for previously unrecorded heritage resource sites to be encountered during construction and operation is low because past land use activities having disturbed a major portion of the area to be affected by the Project. The effect of the Project on heritage resources is assessed as not significant.								
Cemeteries	<ul style="list-style-type: none"> <li>Preparation and implementation of a Cultural and Heritage Resources Protection Plan</li> </ul>	C/O	N-A	L-M	LAA	P	S	I	U			N	N	LAA	P	S	I	D/U
<b>Visual Quality</b>																		
Visual Quality	<ul style="list-style-type: none"> <li>Transmission line routing considered proximity to populated areas, proximity to residences and parks and paralleling opportunities with existing transmission lines an</li> <li>Tower spotting to avoid viewpoints of concern and reduce visual interference at sites identified during public engagement.</li> </ul>	O	A	M	LAA	P	C	R	MR	The change in visual quality associated with the Project is anticipated to affect some residences, rural communities, First Nations and Metis, and stakeholders. The average landscape character is not anticipated to exceed the rural/pastoral with distinguishable development class. The effect of the Project on visual quality is assessed as not significant.	A	M	RAA	P	C	R	MR	The residual cumulative visual quality effects of past, present or reasonably foreseeable future projects are not anticipated to result in the exceedance of an average baseline character class of rural/pastoral with distinguishable development. The Project's main contribution to cumulative effects will be restricted to four viewpoints in the RAA. The cumulative effects of the Project and future projects on visual quality are assessed as not significant.
<b>Human Health Risk</b>																		
Air Quality	<ul style="list-style-type: none"> <li>Emission management during construction</li> <li>Vegetation management plan includes herbicide application management</li> </ul>	C/O	A	N	PDA	ST	IR	R	D	Sources of air emissions for the Project are primarily limited to right-of-way areas for short periods of time. There are no anticipated effects associated with country food quality or residual human health risk effects associated with changes in Project-related noise. Project-related electric and magnetic fields (EMF) are only associated with the operation and maintenance phase. Numerous reviews of research literature on exposure to extremely low frequency EMF and possible adverse health effects have been conducted by international and national scientific and governmental agencies, including Health Canada and the World Health Organization. None of these agencies has concluded that exposure to extremely low frequency EMF is a demonstrated cause of any long-term adverse health effect. The effect of the Project on human health risk is assessed as not significant.	A	N	ROW	ST	IR	R	D	Cumulative effects on air quality will occur only during Project construction and only if emissions from other projects overlap with the Project; herbicide applications for Project needs will comply with Health Canada regulations, as other projects are expected to do; cumulative noise effects will occur during construction if other noise sources add to Project noise. The effects of the Project and future projects on human health risk associated with air quality, country food quality, noise, and EMFs, are anticipated to be negligible and not significant.
Country Food Quality		C	N/A	N/A	N/A	N/A	N/A	N/A	N/A									
Noise Levels		O	N	N	PDA	P	IR	R	D									
		C	A	N	LAA	ST	IR	R	D									
		O	A	L	PDA	P	C	R	D		A	L	ROW	P	C	R	D	
Electric and Magnetic Fields		C	N/A	N/A	N/A	N/A	N/A	N/A	N/A									
		O	N	N	LAA	P	C	R	D		N	N	ROW	P	C	R	D	
<b>Community Health and Well-being</b>																		
Health Effects / Socio-economic Change	<ul style="list-style-type: none"> <li>Transmission line routing to minimize disturbance to landowners</li> <li>Ongoing engagement with regulators and the public to inform them of Project activities</li> </ul>	C	P-A	N	LAA	ST	C	R	MR	Due to the relatively small size of the construction workforce relative to the population within the local area, and with the application of mitigation measures, the Project is not expected to adversely affect community health and well being. It is not anticipated that past and present activities or uses will result in any additional stress and annoyance (i.e.: noise or perceived effects of EMF) or effects on Aboriginal health in the future that are not already present.								
Health Effects / Mobile Workforce	<ul style="list-style-type: none"> <li>Easement agreements with private landowners</li> <li>Continued education on potential health effects of EMF</li> </ul>	C	A	N	LAA	ST	C	R	MR									
Stress and Annoyance		P	A	L	LAA	ST	C	R	MR									
		C	A	L	LAA	ST	IR	R	MR		A	L	RAA	P	C	R	MR	
		O	A	M	LAA	P	C	R	MR									
Aboriginal Health		C/O	A	L	LAA	P	C	I	LR		A	L	RAA	P	C	I	LR	
Health Care Services and Infrastructure		C	A	N	LAA	ST	C	R	MR									
		O	A	N	LAA	P	C	R	MR									

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Magnitude: N: Negligible; L: Low; M: Moderate; H: High Geographic Extent:  
PDA: ROW/Site; LAA: Local; RAA: Regional  
Duration: ST: Short-term; MT: Medium-term; P: Permanent

Frequency: S: Single event; IR: Irregular event; R: Regular event; C: Continuous  
Reversibility: R: Reversible; I: Irreversible  
Ecological Context: U: Undisturbed, D: Disturbed  
Socio-economic Context: HR: High Resilience; MR: Moderate Resilience; LR: Low Resilience  
N/A Not applicable

The transmission line routing process reduced effects to fish and fish habitat by spanning watercourses and avoiding sensitive sites. Effects to vegetation and wetlands were mitigated by avoiding areas of large intact native vegetation patches where possible, particularly any areas of ecological concern. The majority of potential negative effects on wildlife and wildlife habitat were mitigated by considering sensitive wildlife habitat and movement areas, including protected areas and large tracts of intact forests and wetlands. Known heritage sites and those identified during the FNMEP were also considered and avoided where possible. The transmission line routing process reduced interference with existing transportation, utility and communication infrastructure to the extent possible. Effects to agriculture were reduced by routing a substantive portion of the Project transmission line within existing transmission corridors. Visual effects were also considered during routing through the consideration of proximity of route alternatives to residences, communities, parks, cultural sites, and other such locations, and will be given further consideration in final design and tower spotting. Routing also considered proximity to potential human health receptors such as houses, schools, daycares, recreational centres, sites of worship, campgrounds, and picnic areas.

Two of the central issues raised and evaluated throughout the transmission line routing process were the competing values between the use of private or Crown lands, and the relative effect on natural habitat (typically associated with Crown land) versus farmland or residences (private lands). The models and related criteria used in the route evaluation process represented tradeoffs between these values in the decision making process, and helped guide the selection of a route that balances the two.

## 24.3 Summary of Mitigation Measures and Commitments

Manitoba Hydro has extensive experience in the development of environment protection, monitoring and follow-up plans for all sizes of projects in many different environments. Chapter 22 outlines the Environmental Management Program under which environmental protection commitments, mitigation measures and follow-up actions identified in the Project EIS will be implemented, managed, reported and evaluated. As part of the Program, Manitoba Hydro will develop a Construction Environmental Protection Plan (CEnvPP), which is composed of both general and specific environmental protection measures for the Project, including mitigation measures identified in the EIS. These include design mitigation, provincial and federal regulatory requirements, Manitoba Hydro environmental policies and commitments and input from the public and First Nation and Metis engagement processes. Specific environmental protection measures are provided for environmentally sensitive sites (ESS) identified during engagement processes and assessment activities.

The Program incorporates the principles of adaptive management allowing for the flexibility in mitigation of environmental effects that may result from the Project. Adaptive management is an iterative process which involves phases of planning, implementation, evaluation and learning,

with adjustments being made at any stage of the process where needed. Information gathered during follow up and monitoring activities will be used to verify the accuracy of the environmental assessment effects predictions and the effectiveness of implemented mitigation measures. Manitoba Hydro is committed to continue sharing information with the public and working with interested parties through ongoing monitoring and the Environmental Protection Program.

## 24.4 Summary of Residual Effects

The Project's potential effects were assessed in the context of each VC's existing condition. As an understanding of the Project was developed, the effects pathways were developed, and then standard and Project-specific mitigation were developed to address any potential negative effects. Then the residual effects, following the implementation of mitigation measures, were described for each Project phase (construction, operation and maintenance). Finally, the determination of significance was made using VC thresholds, as appropriate.

Following the application of mitigation Manitoba Hydro has concluded that no residual adverse Project effects exceed the applied thresholds for significance.

## 24.5 Summary of Cumulative Environmental Effects

The cumulative environmental effects were assessed following the same iterative process and format used for Project effects; namely, description and analysis of cumulative effects, mitigation of cumulative effects, and characterization of residual cumulative effects. For cumulative environmental effects, the determination of significance was made using the same VC-specific thresholds as for Project environmental effects. The contribution of the Project to the cumulative environmental effect was identified quantitatively where possible, and where not possible a qualitative description was provided. Where identified, adverse residual effects of the Project were considered in combination with the effects of past, current and reasonably foreseeable future projects that overlap temporally and spatially with the Project effects and a determination of significance was made.

The Existing Corridor has seen substantial ecological change over the last one hundred years with much of the native prairie converted to agriculture, road and drainage infrastructure and urban and rural settlements. As such, many natural values on this landscape have been diminished and, in some cases and in some areas, lost. These ecological changes are the consequence of numerous land and resource use decisions by many administrative jurisdictions and governments over an extended period of time; typically in order to advance economic opportunities to support the growing population. As a result, there has been a gradual displacement of natural features. The cumulative effects assessment for the Project recognized, to the extent possible and meaningful, the influences of the past, the role landscape change has played in determining current conditions, and how the past affects this assessment's conclusions. Considerate of these past effects, the FPR within the Existing Corridor was located in primarily

developed lands, adjacent to existing and future transmission lines, and in an area set aside decades earlier for this type of development. By assessing the existing corridor in its entirety, rather than just the ROW required for this Project alone, conclusions are conservative. Because the transmission line is routed in this Existing Corridor for nearly half its length, it is expected that cumulative effects resulting from the Project in combination with past projects may not be fully additive (*i.e.*, reflect the sum of individual effects of all projects). By using the Existing Corridor, development is concentrated, which in general reduces the biophysical and socio-economic effects in comparison to the creation of a new and separate right-of-way.

Determining the location of the New ROW included an understanding of the need to balance socio-economic concerns of private landowners and municipal development plans while maintaining critical areas and habitats supportive of priority resources to align with resource management goals. The FPR strikes a balance between these competing values, as well as avoids key features understood to be important, such as tall-grass prairie, all Federal lands, Protected Areas, Ecological Reserves, Wildlife Management Areas, three major bog complexes, the core range of the Vita elk herd, and key heritage and culturally important sites. This process balances ecosystem sustainability with long-term economic prosperity and social equity and is in alignment with Manitoba's sustainability goals.

Following the application of mitigation, Manitoba Hydro has concluded, no cumulative residual adverse Project effects exceed the applied thresholds for significance. A summary of cumulative effects for the Project is provided in Table 24-1.

## 24.6 Concluding Statement and Summary

The Project will facilitate the conveyance of clean, renewable energy to southern markets, build reliability within the Manitoba transmission system and contribute to Manitoba's economic future. The EIS for this Project is the result of several years of planning, environmental studies and engagement with a broad range of interests. After considering Project residual effects, and the overlap with past, present and future projects, Manitoba Hydro concludes that the Project will not result in significant effects to the biophysical or socioeconomic environment. Manitoba Hydro is committed to continue sharing information with the public and working with interested parties through ongoing monitoring and the Environmental Protection Program. Manitoba Hydro continues to benefit from the knowledge gained through decades of routing, building and managing transmission lines and will continue to do so in the future.

These findings are based on an EIS prepared to meet pertinent provincial and federal regulatory requirements and guidelines. As such, Manitoba Hydro believes the Project should be granted regulatory approval to proceed.

## 24.7 References

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